# RESEARCH PROGRESS REPORT FOR THE QUARTER ENDING:

Wisconsin Department of Transportation
DT1241 2009

| Research, Development and Technology Transfer | | |
|---|---|---|
| **Program:** (Choose One)<br>☐ **Policy Research** ☐ **Pooled Fund** **TPF #**<br>☒ **Wisconsin Highway Research Program** ☐ **Other** | | |
| **Project Title:** Evaluation of the Foundation Movements of Transportation Structures | | |
| **Administrative Contact/Phone #:** Peg Lafky / (608)266-3663 | **WisDOT Project ID(s):** | 0092-09-05 |
| **WisDOT Technical Contact/Phone #:** Robert Arndorfer / (608)246-7940 | **Other Project ID:** | |
| **Project Investigator/Phone # (agency & contact):** James Schneider (jamess@cae.wisc.edu) 608-890-2662 | **Approved Starting Date:** | 2/5/2009 |
| **WisDOT Comments:** | **Original End Date:** | 2/5/2012 |
| | **Current End Date:** | 2/5/2012 |
| **Sponsor:** Wisconsin Department of Transportation | **Number of Extensions:** | 0 |

**Schedule Status:**

☒ On schedule ☐ Ahead of schedule
☐ On revised schedule ☐ Behind schedule (Please explain below)

| Total Project Budget | Expenditures Current Quarter | Total Expenditures | % Funds Expended | % Work Completed |
|---|---|---|---|---|
| $109,893.00 | $9,386.16 | $9,386.16 | 12% | 5% |

Project Description:
The overall research objective of this study is to produce a document summarizing simplified design procedures for evaluation of foundation movements for transportation structures within the LRFD framework. Recommendations for the measurement and selection of input parameters for those design procedures will also be provided.

Progress This Quarter: (Includes project committee meetings, work plan status, contract status, significant progress, etc.)
The project consists of five main tasks (1) Literature Review and Database Development; (2) Field Monitoring of Shallow Foundations; (3) Field Monitoring of Deep Foundations; (4) Field Monitoring of Laterally Loaded Piles; and (5) Data Compilation and Analysis. Over the past quarter efforts have focused on Task 1, Literature Review and Database Development. Progress has been made towards compilation and analysis of a database of load tests on axially loaded deep and shallow foundations as well as laterally loaded foundations, assessment of design method formulations and performance, and finite element analysis of in situ tests and foundation response. Some work has been performed related to assessment of appropriate instrumentation for foundation monitoring.

A technical paper has been submitted to the 2009 Deep Foundations annual conference discussing application of LRFD methods to deep foundation design:
Schneider, J.A. 2009. “Uncertainty and bias in evaluation of LRFD ultimate limit state for axial loading of driven piles,” DFI Annual Conference on Deep Foundations, submitted.

Anticipated Work Next Quarter:
The major tasks for next quarter are (i) to identify potential field sites for instrumentation; (ii) develop instrumentation programs for appropriate sites; (iii) work with contractors to install instrumentation; and (iv) continue with literature review and database development.

Circumstances Affecting Progress and/or Budget:
The project start date was delayed from October 2008 until February 2009. This may affect timing with regards to instrumentation of field sites.

Gantt Chart:

| | Feb 2009 - Jan 2010 | | | | Feb 2010 - Jan 2011 | | | | Feb 2011 - Jan 2012 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Activity** | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| **Task 1 - Literature Review / Database development & interpretation** | | | | | | | | | | | | |
| Commence Project | X | | | | | | | | | | | |
| Develop database of load tests | | | | | | | | | | | | |
| Analyze existing methods | | | | | | | | | | | | |
| FE parametric studies | | | | | | | | | | | | |
| Develop list of potential field sites | | | | | | | | | | | | |
| Assess appropriate instrumentation | | | | | | | | | | | | |
| **Task 2 - Field monitoring and interpretation** | | | | | | | | | | | | |
| Field testing for shallow foundations | | | | | | | | | | | | |
| Field testing for deep foundations | | | | | | | | | | | | |
| Field testing for lateral piles analysis | | | | | | | | | | | | |
| Data compilation and analysis | | | | | | | | | | | | |
| **Reporting** | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Quarterly | X | X | X | X | X | X | X | X | X | X | X | X |
| POT Review | | | | X | | | | | | | X | |
| Literature Review | | | | D | F | | | | | | | |
| Final Report | | | | | | | | | | | D | F |

D = Draft Report; F = Final Report